1970

OPERATING SUMMARY

POINT EDWARD

water pollution control plant

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.

D. S. Caverly,
General Manager.

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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POINT EDWARD

water pollution control plant

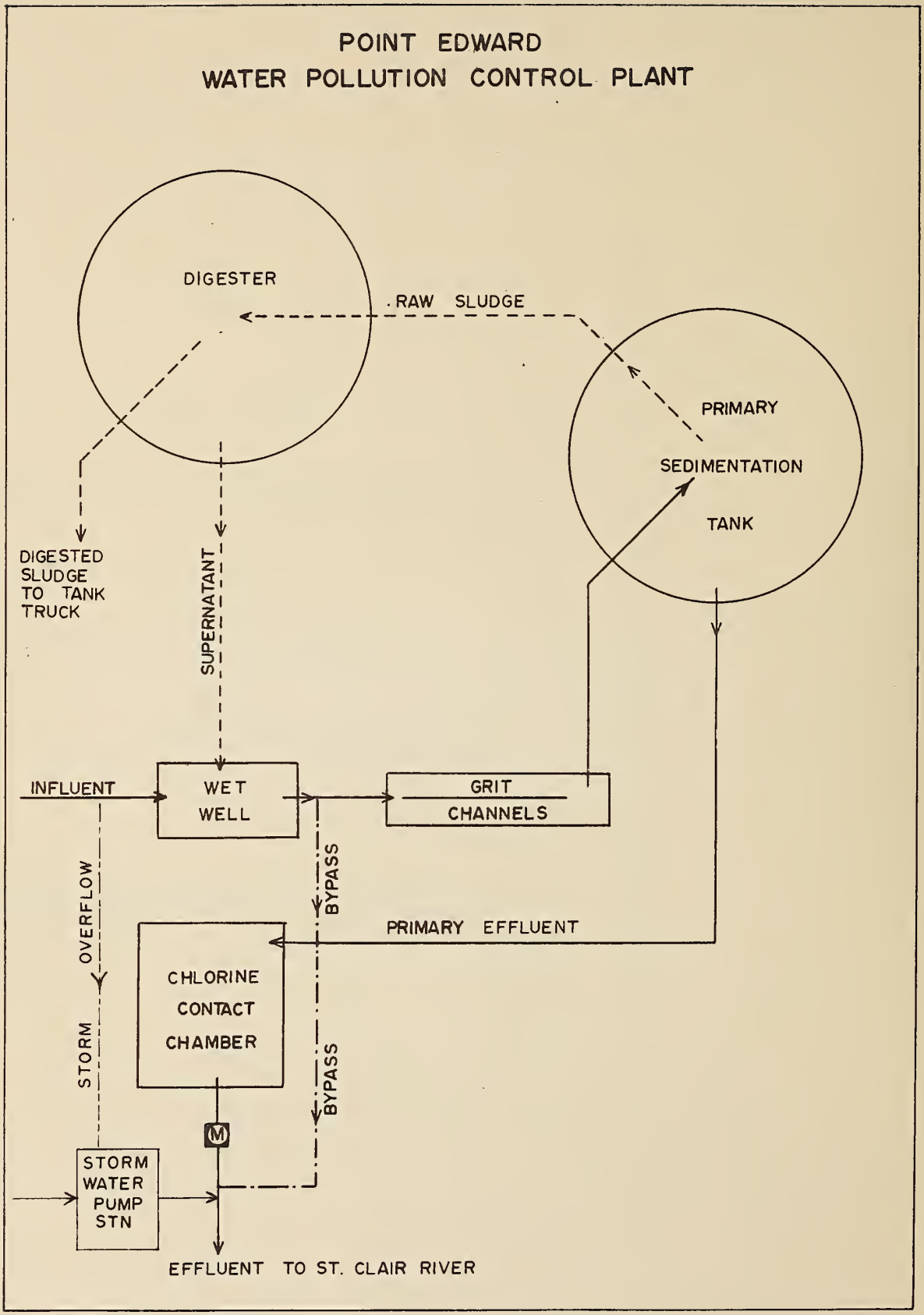
operated for

THE VILLAGE OF POINT EDWARD

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY


POINT EDWARD
WATER POLLUTION CONTROL PLANT
DIGESTER
RAW SLUDGE
PRIMARY
SEDIMENTATION
TANK
DIGESTED
SLUDGE
TO TANK
TRUCK
SUPERNATANT
INFLUENT
WET
WELL
GRIT
CHANNELS
BYPASS
OVERFLOW
PRIMARY EFFLUENT
CHLORINE
CONTACT
CHAMBER
STORM
BYPASS
M
STORM
WATER
PUMP
STN
EFFLUENT TO ST. CLAIR RIVER

DESIGN DATA

PROJECT NO.	2-0036-59	TREATMENT	Primary
DESIGN FLOW	0.57 mgd	DESIGN POPULATION	5,700
BOD - Raw Sewage	170 mg/l	SS - Raw Sewage	200 mg/l
- Removal	47%	- Removal	60%

RAW SEWAGE PUMPS

Type: Fairbanks-Morse
Size: Two 1300 Igpm @ 35' tdh

PRIMARY TREATMENT

Screening

Type: Bar screens, manually cleaned
Size: Two; $1\frac{1}{4}$" spacing

Grit Removal

Type: Channels
Size: Two 16 X 1.75 X 2'
Retention: 0.88 min

Primary Sedimentation

Type: Dorr
Size: One 35' dia x 10' swd
(60,000 Imp. gal)
Retention: 2.53 hr
Loading: Surface, 594 Imp. gal/ft^2/day
Weir, 5,190 Imp. gal/ft/day

CHLORINATION

Type: BIF
Size: One 200 lb/day

Chlorine Contact Chamber

Size: One 20 X 10 X $8\frac{1}{2}$' (10,600 gal)
Retention: 27 min

OUTFALL

- to St. Clair River

SLUDGE HANDLING

Digestion System - Single-stage

Type: Dorr: 2 draft tube mixers
Size: One 35' dia x 20' swd (19,200 cu ft or 119,808 gal)
Loading: 1.07 lb/cu ft/mo

PUMPING STATIONS

Storm Water

Type: Custom Built
Size: One 4700 gpm @ 20' tdh
Two 10000 gpm @ 20' tdh
with two 100 hp diesel standbys

Helena Street

Type: Smith & Loveless
package lift station
Size: Two 750 gpm @ 40' tdh

Michigan Avenue

Type: Smith & Loveless
package lift station
Size: Two 500 gpm @ 20' tdh

402 Station (2-0183-65)

Type: Smith & Loveless
Package Lift Station
Size: Two 175 gpm @ 23' tdh

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	.21	—	6.47	—
High	.40	June	7.37	April
Low	.17	Jan. July Oct.	5.48	February

GENERAL

This project consists of a 0.57 mgd primary treatment plant complete with raw sewage pumping, grit removal, primary sedimentation, chlorination, single-stage digestion and liquid sludge haulage. The project also includes a complete sewer system containing three pumping stations.

During 1970, the operation of a newly constructed 29 mgd storm water pumping station located on plant grounds was turned over to the Commission by the Village of Point Edward. It is expected that financial arrangements between the Commission and the Village concerning the station will be completed during 1971.

Industrial waste dumping was reduced considerably, as a result of enforcement of new industrial waste by-laws enacted by the Village. However, the digester had to be cleaned out during the year as a result of the accummulative effects of many oil spills.

EXPENDITURE - (1969 figures in brackets)

The operating costs for 1970 were $21,161.18 ($17,289.62) or $272.56 ($222.32) per million gallons treated. The increased costs resulted largely from charging part of the cost of the digester cleanout to the operating budget.

PLANT FLOWS and CHLORINATION

A total of 77.64 million gallons of sewage was treated during the year, resulting in an average hydraulic load factor of 0.37, relatively unchanged since 1966. The maximum daily flow of 400,000 gallons represents 89% of plant capacity.

Disinfection of the final effluent is practised year round. During 1970, 10,450 lbs. of chlorine were required, at an average dosage of 13.5 mg/l for disinfection.

PLANT EFFICIENCY

The raw sewage BOD concentration averaged 262 mg/l and suspended solids averaged 207 mg/l.

The plant produced an average reduction of 33% for BOD and 57% for suspended solids. The reduction was close to the design expectations for suspended solids. Reduction of BOD concentrations improved slightly over past years.

Grit removal averaged 2.8 cubic feet per million gallons within the normal range although considerably increased from last year.

SLUDGE DIGESTION and DISPOSAL

During 1970 both the volume and solids concentration of the raw sludge pumped to the digester remained at last year's level.

The digester was cleaned out during June and July. A large quantity of sand which had accumulated in the bottom of the digester over the years was removed. A bulkhead was installed in the side of the digester to provide access when required in future. During the remainder of the year the solids concentration was allowed to build up in the digester, and haulage was not required.

CONCLUSIONS

The plant operated at 37% hydraulic capacity, unchanged from last year. It should not require hydraulic expansion for a good many years.

The plant was well operated during 1970, but since it is only a primary plant, it has never met the OWRC effluent objective of 15 mg/l BOD and suspended solids. Reduction in BOD during the year averaged only 33% and therefore consideration should be given to expanding the plant to secondary treatment.

PROJECT COSTS

2-0036-59 NET CAPITAL COST (Final)	$779,773.82
DEDUCT - Portion financed by CMHC/MDLB (Final)	-
Long Term Debt to OWRC	$779,773.82
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	$194,485.91
Net Operating	$ 21,161.18
Debt Retirement	15,736.00
Reserve	3,282.50
Interest Charged	43,687.77
TOTAL	$ 83,867.45

RESERVE ACCOUNT

Balance @ January 1, 1970	$ 47,322.41
Deposited by Municipality	3,282.50
Interest Earned	3,104.56
	$ 53,709.47
Less Expenditures	3,000.00
Balance @ December 31, 1970	$ 50,709.47

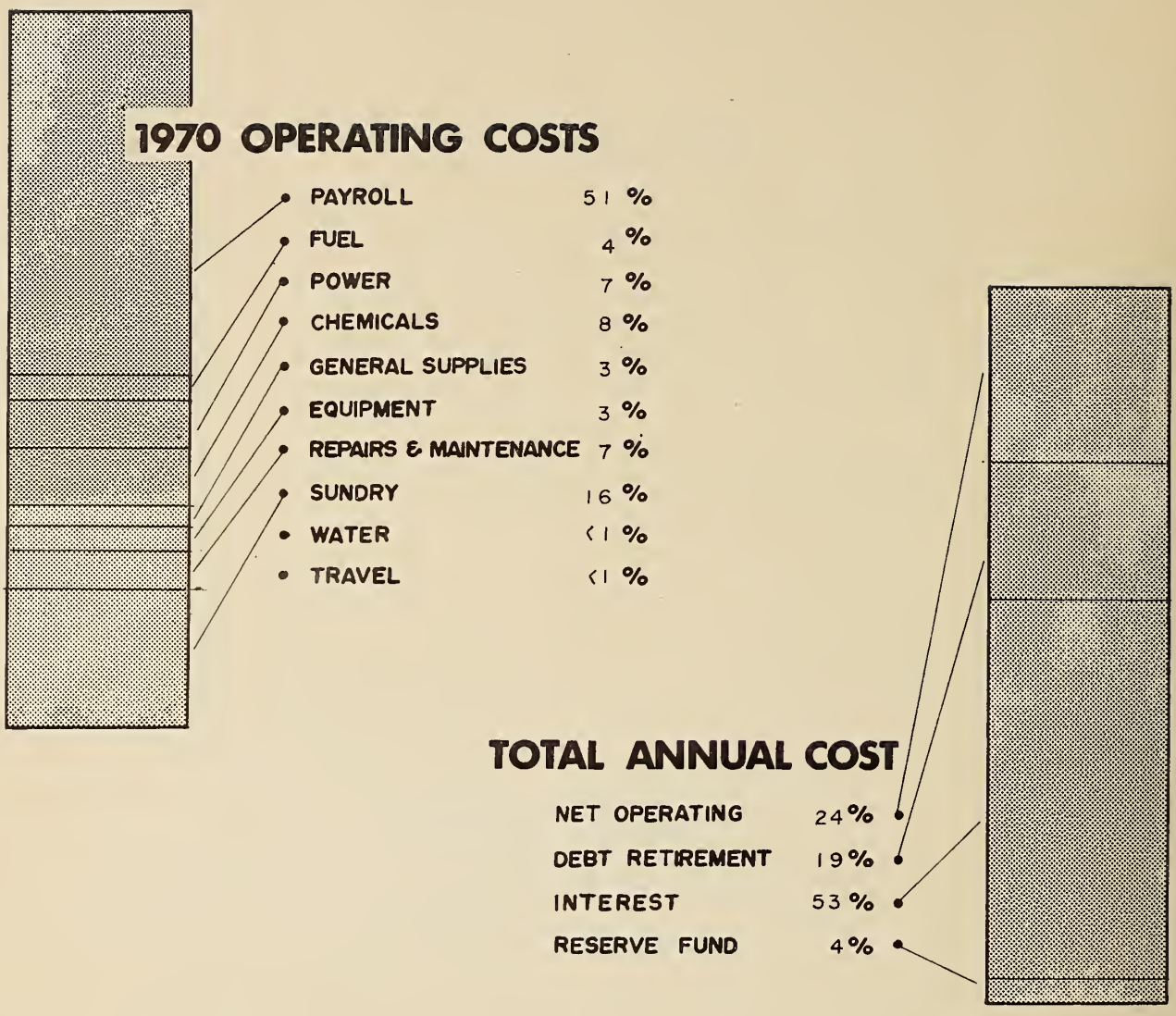
PROJECT COSTS

2-0183-65

NET CAPITAL COST (Final)	$47,428.72
DEDUCT - Portion financed by CMHC/MDLB (Final)	-
Long Term Debt to OWRC	$47,428.72
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	$ 5,687.15
Net Operating	$ -
Debt Retirement	1,259.00
Reserve	218.63
Interest Charged	2,636.80
TOTAL	$ 4,114.43

RESERVE ACCOUNT

Balance @ January 1, 1970	$ 797.37
Deposited by Municipality	218.63
Interest Earned	56.97
	$ 1,072.97
Less Expenditures	-
Balance @ December 31, 1970	$ 1,072.97



Yearly Operating Costs

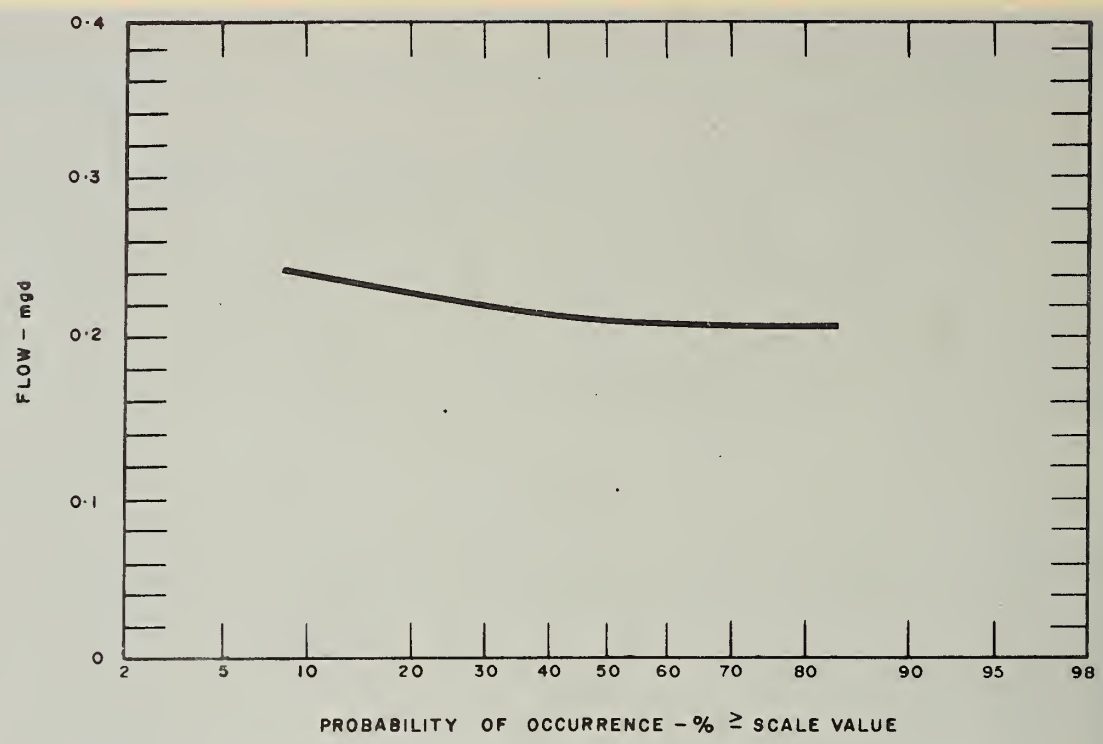
YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	75.92	$12,800.22	$168.61	0.21
1967	76.61	13,419.58	175.17	0.20
1968	75.95	16,298.62	214.60	0.29
1969	77.77	17,289.69	222.32	0.35
1970	77.64	21,161.18	272.56	0.39

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	1395.71	965.77	155.54	106.29	116.70	-	36.88	-	-	3.40	11.13	-
FEB	1443.62	698.41	32.20	147.62	118.83	220.50	71.53	-	-	154.53	-	-
MAR	1328.39	693.78	24.20	117.12	106.97	220.50	8.80	-	92.06	53.45	11.51	-
APR	1440.67	685.13	131.00	122.82	105.77	-	68.69	-	155.34	171.92	-	-
MAY	2181.80	759.32	50.49	99.34	110.51	-	49.38	-	968.23	111.40	10.98	22.15
JUNE	1104.04	691.49	126.60	71.52	112.09	-	44.90	-	(64.00)	121.44	-	-
JULY	1779.43	692.07	400.05	12.13	106.61	-	116.05	-	-	442.26	10.26	-
AUG	1805.89	1033.72	526.56	37.49	97.43	-	57.94	-	-	52.75	-	-
SEPT	1778.49	660.71	256.70	46.25	179.07	-	57.04	-	-	567.38	11.34	-
OCT	979.30	679.60	51.14	45.07	74.54	-	23.34	(100.00)	117.76	26.85	-	61.00
NOV	1765.62	755.86	36.00	53.35	7.18	803.25	87.98	-	-	22.00	-	-
DEC	4150.22	663.01	32.00	91.46	238.37	535.50	17.10	720.00	112.54	1737.47	10.77	-
TOTAL	21161.18	8978.87	1822.48	950.46	1374.07	1779.75	639.63	620.00	1381.93	3464.85	65.99	83.15

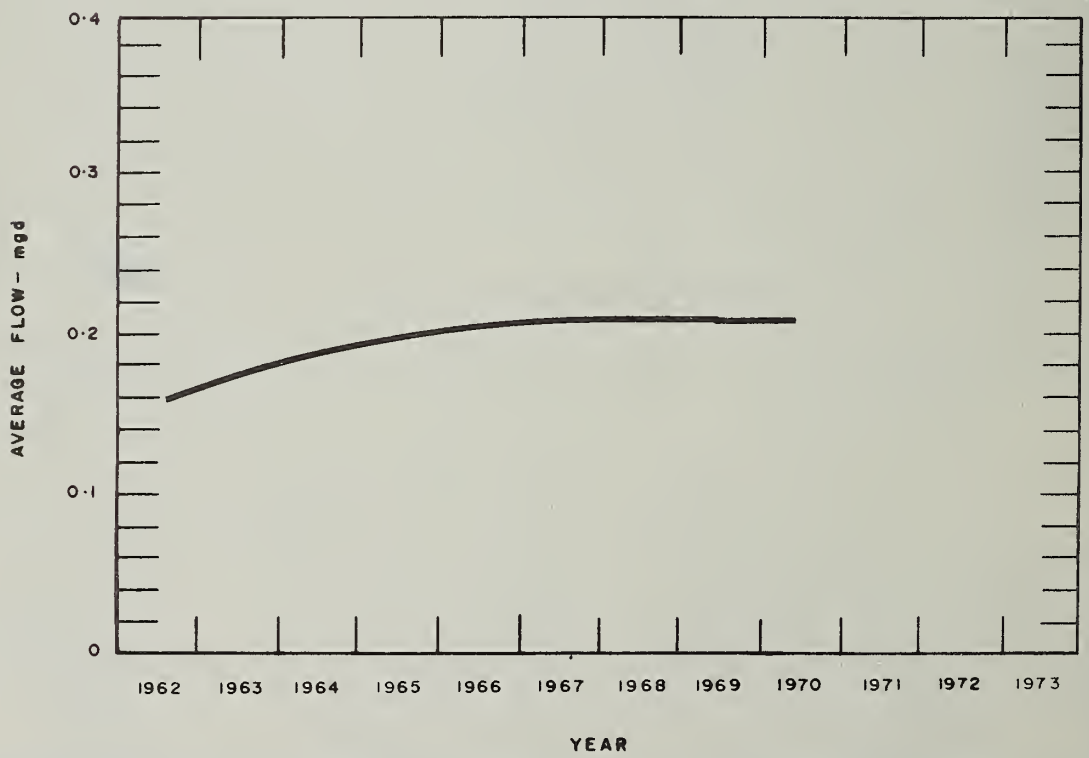
BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE $3,750.00



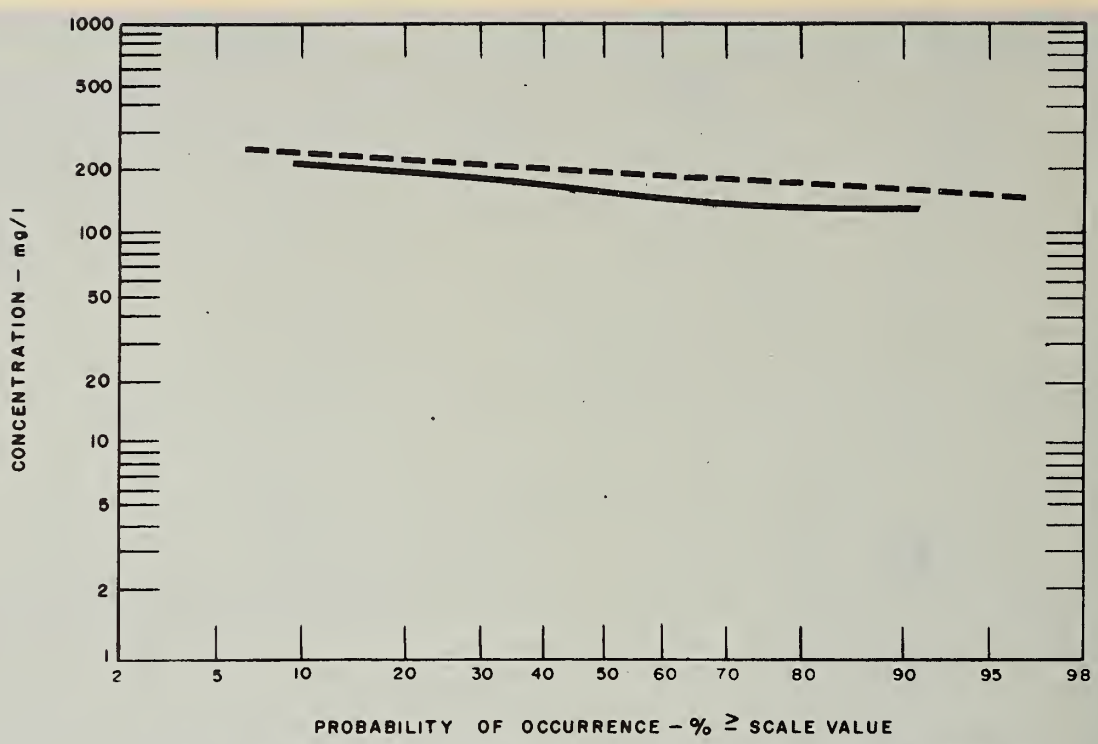
FLOWS

NOMINAL CAPACITY 0·57 M.G.D.

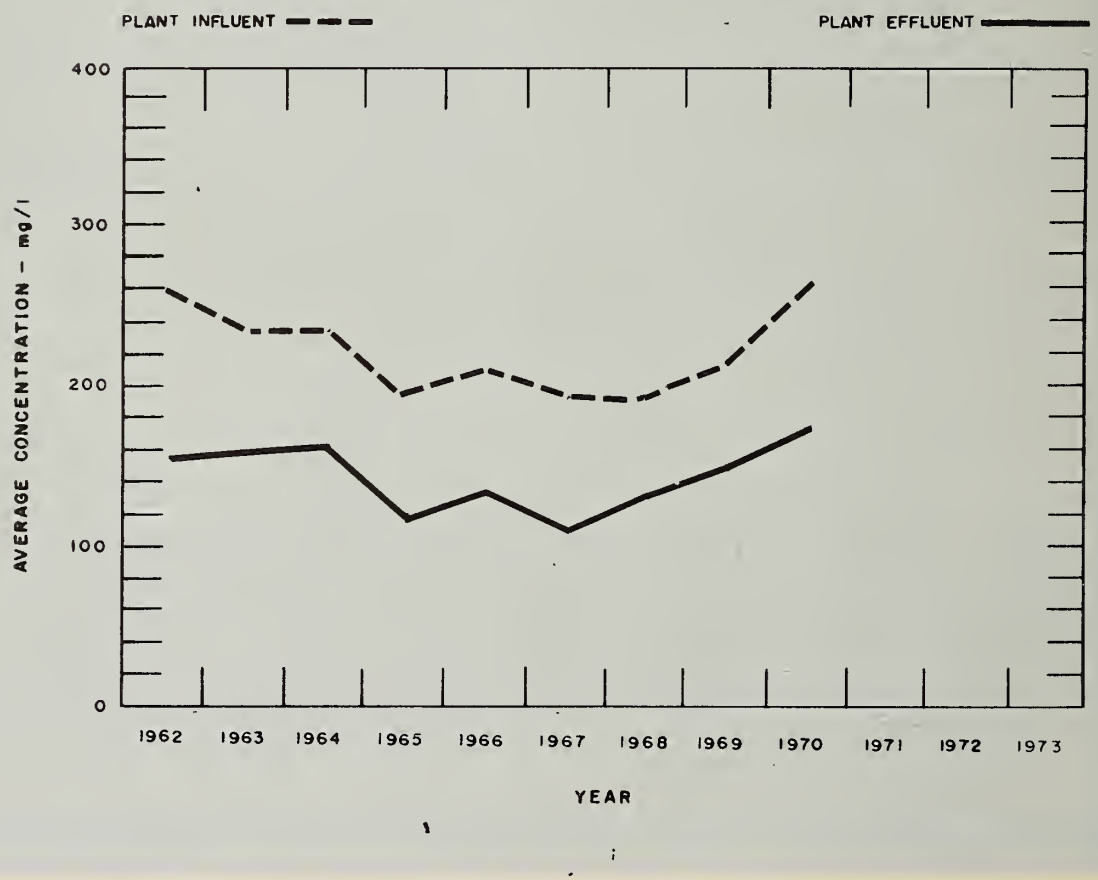


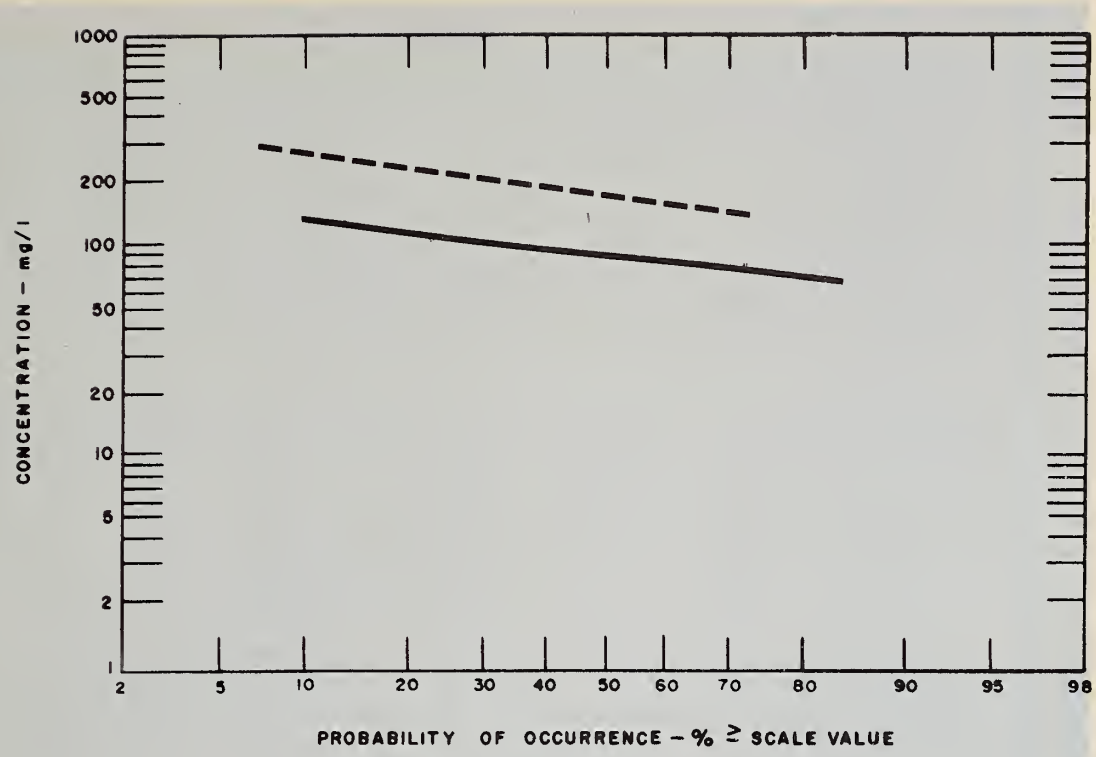
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	5.92	.19	.25	.17	880	14.9
FEB	5.48	.20	.24	.18	820	15.1
MAR	6.33	.20	.29	.18	800	12.6
APR	7.37	.25	.35	.20	870	11.8
MAY	7.04	.23	.29	.20	950	13.5
JUNE	7.31	.24	.40	.21	910	12.4
JULY	5.92	.22	.28	.17	850	14.4
AUG	6.47	.21	.23	.18	820	12.7
SEPT	6.38	.21	.29	.19	850	13.3
OCT	6.08	.20	.21	.17	890	14.7
NOV	6.65	.22	.29	.19	900	13.5
DEC	6.69	.22	.25	.19	910	13.6
TOTAL	77.64	-	-	-	10450	-
AVERAGE	6.47	.21	-	-	870	13.5

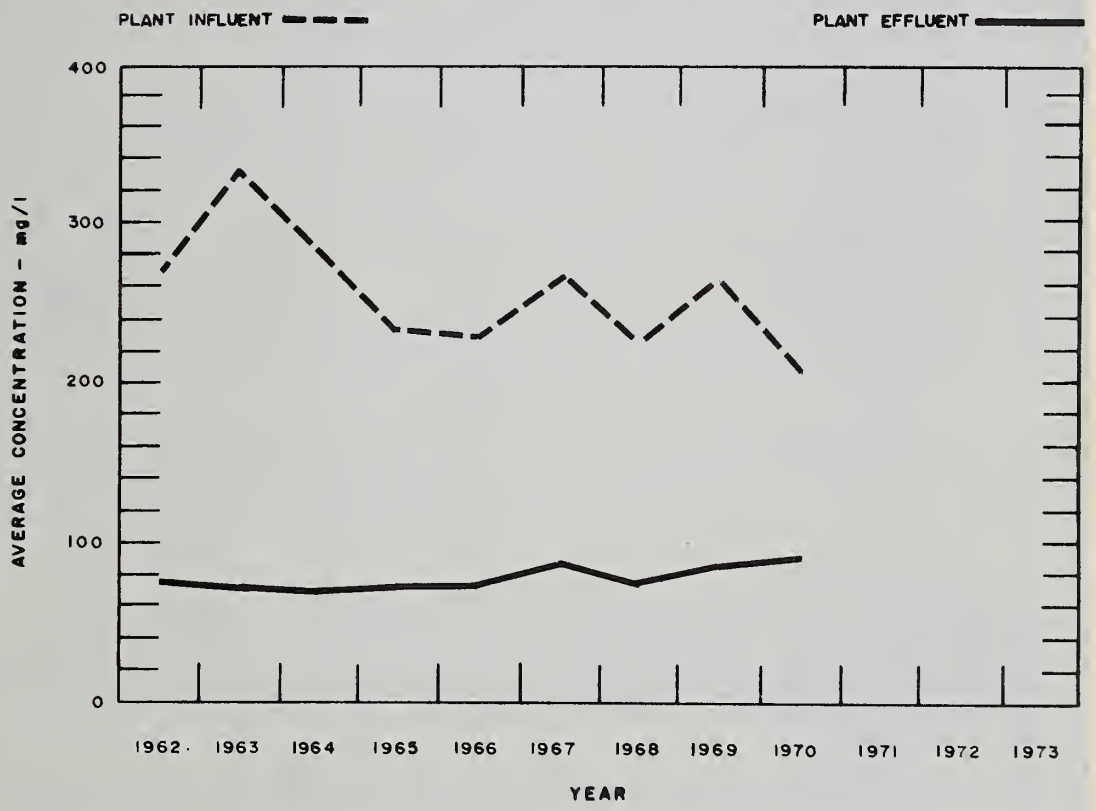


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS

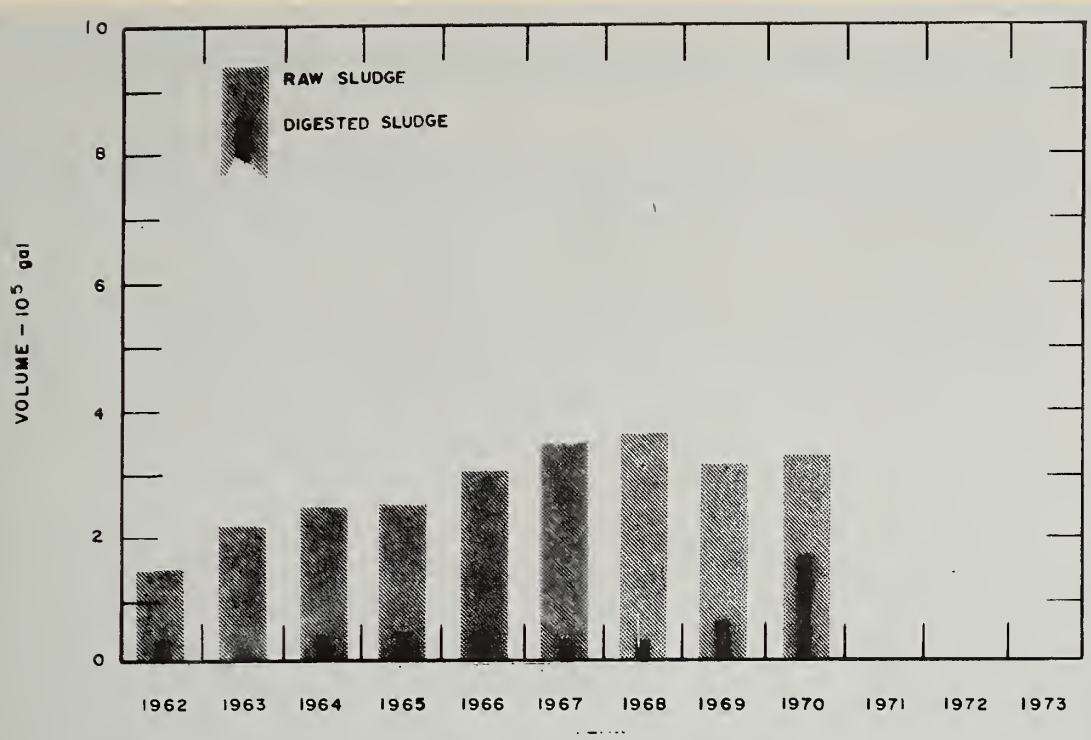


PLANT EFFICIENCY

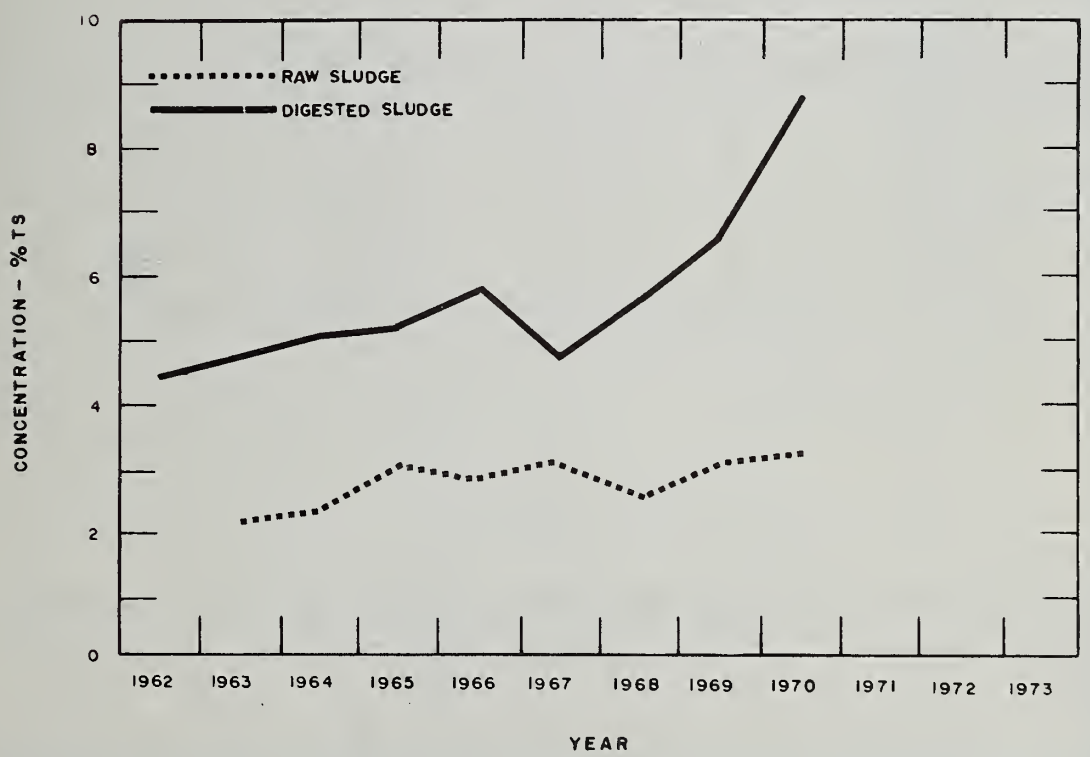
MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10^3 pounds	n	mg/l	n	mg/l	%	10^3 pounds	cu ft
JAN	2	200	2	135	33	3.8	2	191	2	56	71	8.0	16
FEB	2	210	2	170	19	2.2	2	276	2	114	59	5.8	15
MAR	3	657	3	250	62	25.8	3	333	3	110	67	14.1	15
APR	2	165	2	175	0	0	2	166	2	79	52	6.4	15
MAY	2	210	2	170	19	2.8	2	156	2	82	47	5.2	18
JUNE	1	190	1	110	42	5.8	1	192	1	66	66	9.2	17
JULY	-	-	-	-	-	-	-	-	-	-	-	-	10
AUG	1	200	1	190	5	.6	1	198	1	90	55	7.0	18
SEPT	3	226	3	193	15	2.1	3	174	3	87	50	5.6	27
OCT	2	205	2	170	17	2.2	2	161	2	93	42	4.1	18
NOV	2	170	2	150	11	1.3	2	235	2	102	57	8.8	27
DEC	2	200	2	165	18	2.3	2	140	2	85	39	3.7	24
TOTAL	22	-	22	-	-	-	22	-	22	-	-	-	220
AVERAGE	-	262*	-	177*	33	4.4	-	* 207	-	*90	57	7.1	18

NOTE - n is the number of samples taken

* Weighted Average


RAW SLUDGE
DIGESTED SLUDGE
VOLUME – 10^5 gal
0
2
4
6
8
10
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973

DIGESTION


RAW SLUDGE
DIGESTED SLUDGE
CONCENTRATION – % TS
0
2
4
6
8
10
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
YEAR

SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10^3 gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10^3 gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10 gal	TOTAL SOLIDS %	DEWATERED cu yd	LIQUID cu yd
JAN	33.3	3.8	75	5.4	5.8	57	-	.5	-	32
FEB	30.8	2.9	75	5.4	7.6	57.	-	.4	-	32
MAR	34.1	2.2	76	9.4	10.0	56	-	.4	-	56
APR	31.8	3.2	78	5.4	10.3	57	-	.4	-	32
MAY	30.7	3.2	78	8.1	10.1	59	-	1.1	-	48
JUNE	28.8	4.0	78	111.6*	9.6	60	-	.5	-	662
JULY	18.8	-	-	43.1*	-	-	-	-	-	283
AUG	27.2	--	-	-	-	-	-	-	-	-
SEPT	25.7	-	-	-	-	-	-	-	-	-
OCT	26.5	-	-	-	-	-	-	-	-	-
NOV	26.2	-	-	-	-	-	-	-	-	-
DEC	26.5	-	-	-	-	-	-	-	-	-
TOTAL	340.4	-	-	188.4	-	-	-	-	-	1145
AVERAGE	28.4	3.2	77	26.9	8.9	58	-	.6	-	164

* Digester cleanout

Water management in Ontario